

REMARKS

Upon entry of the Amendment, Claims 1, 4-9, 11-15 and 17 are all the claims pending in the application.

Claim 9 has been amended to recite that the reaction film forming agent is selected from the group consisting of dialkyldithiocarbamic acid compounds and dialkyldithiophosphoric acid compounds. Claim 10 has been canceled.

Claim 13 has been amended to incorporate the subject matter of Claim 16, now canceled.

No new matter is added.

Entry of the Amendment along with reconsideration and review of the claims on the merits are respectfully requested.

Claim Rejections - 35 U.S.C. § 103

A. Claims 1 and 4-17 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Yokouchi et al. (U.S. Patent 5,840,066) in view of Heimann et al. (U.S. Patent 6,010,984), for the reasons given in the Office Action.

The Examiner cited Yokouchi et al. as teaching a rolling bearing having sealed therein a grease composition comprising a base oil, a urea thickener, and an inorganic filler having an average particle size of not greater than 2 micrometers.

The Examiner recognized that Yokouchi et al. fails to teach the addition of a pH adjustor. However, the Examiner cited Heimann et al. as teaching lubricant and grease compositions

where the pH of the grease, typically a pH from about 7 to about 14, can be tailored to be compatible with the metal surface which is contacted with the grease or gel.

The Examiner considered that a person of ordinary skill, armed with the disclosure of Heimann et al., would have found it obvious to add a pH adjustor to the grease composition of Yokouchi et al. in order to adjust the pH to “about 7 to about 14” and tailor the grease to be compatible with the metal surface which is contacted with the grease with a reasonable expectation of enhancing the corrosion resistance of said composition.

Applicants respond as follows.

Applicants incorporate by reference the Remarks given in the Amendment under 37 C.F.R. § 1.116 filed on July 28, 2004, and additionally respond as follows.

Heimann et al. is not combinable with Yokouchi et al. The present claims are directed to rolling bearings, but such application is neither disclosed nor referenced in Heimann et al. For example, at column 2, Heimann discloses that his inventive grease/gel is used in environments where improved corrosion resistance is desired, for example, wire rope and strand used in a wide range of applications including automotive and marine end-uses (see col. 2, lines 39-43). On the other hand, like the present invention, the Yokouchi et al. primary reference is directly related to a rolling bearing. There is no discussion in Yokouchi et al of using the rolling bearing in a marine environment or environment where improved corrosion resistance is needed. Thus, there is no motivation to add a pH adjustor of Heimann to the rolling bearing of Yokouchi because Yokouchi et al does not call for protection from corrosive environments.

Another important point is that column 8 of Heimann describes an extensive list of additives, but does not describe or discuss particles comprising an inorganic compound having an average particle size of 2 μm or smaller as claimed. This is because one of ordinary skill would expect such particles to impair the corrosion resistance of the grease/gel of Heimann. This is just another reason why one skilled in the art would not add a pH adjustor of Heimann to the grease composition of Yokouchi. Thus, Yokouchi and Heimann are not properly combined against the present inventions Claims 1 and 11.

Claim 9 has been amended to recite that the reaction film forming agent is selected from the group consisting of dialkyldithiocarbamic acid compounds and dialkyldithiophosphoric acid compounds. Claim 10 has been canceled. Heimann and Yokouchi do not disclose the specific reaction film forming agents now required by Claim 9. The significance of the reaction film forming agent of the present invention, and specifically dialkyldithiocarbamic acid compounds and dialkyldithiophosphoric acid compounds, is described at Paragraph [102] on page 31 of the specification.

Namely, when one of the specifically claimed organic metal salts is incorporated into the lubricant, hydrogen atoms adsorbed onto the surface of the bearing material are prevented from diffusing inside of the bearing material. As a result, early flaking of the bearing material is avoided so as to improve the bearing life. Also, relationship of pH on the film forming agent is described at page 36, Paragraph [111], of the specification as follows: "Even if the hydrogen ion exponent pH is in an acidic region of 7 or lower, early flaking of the bearing material can be prevented by incorporating the reaction film forming agent comprising the organic metal salt or

ADTC into the lubricant. However, mere addition of the reaction film forming agent is insufficient.”

None of Heimann and Yokouchi discloses, teaches or otherwise suggests the above characteristic feature of amended claim 9.

Claim 13 has been amended to incorporate therein the subject matter of Claim 16. Claim 13 now requires a thickener selected from at least one of an aromatic diurea compound and a non-aromatic diurea compound where residues of these compounds have a specific range of molar ratios as defined in the claim. This specific range of molar ratios is not disclosed by any of Yokouchi et al and Heimann et al. The use of thickeners is discussed beginning at page 41, Paragraph [128]. The significance of the limitation of original Claim 16 is discussed more particularly at page 44, Paragraph [132]-[133], describing that if the aromatic ring molar ratio is less than 0.5, the lubricant is liable to leak, and if the aromatic ring molar ratio exceeds 0.95, the flowability decreases to reduce seizure resistance.

The dependent claims are patentable for at least the same reasons given above with respect to the independent claims.

Accordingly, Applicants respectfully request reconsideration and withdrawal of the obviousness rejection over Yokouchi et al in view of Heimann et al.

B. Claims 1 and 4-17 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Naka et al. (U.S. Patent 5,728,659) in view of Heimann et al. and Yokouchi et al., for the reasons given in the Office Action.

The Examiner cited Naka et al. as teaching a grease composition within the scope of the lubricant contained in the rolling bearing of the present invention.

The Examiner recognized that Naka et al. fails to teach the addition of a pH adjustor and inorganic particles having an average particle size of 2 micrometers or less. However, the Examiner cites Heimann et al. as teaching that the grease will typically have a pH that ranges from about 7 to about 14. The Examiner cites Yokouchi et al. as teaching a rolling bearing having sealed therein a grease composition comprising a base oil, a urea thickener, and an inorganic filler having an average particle size of not greater than 2 micrometers.

The Examiner considered that it would have been obvious to one of ordinary skill to add a pH adjustor as taught by Heimann et al. to the grease composition of Naka et al. in order to adjust the pH to “about 7 to about 14” and to tailor the grease to be compatible with the metal surface which is in contact with the grease with a reasonable expectation of enhancing corrosion resistance. Additionally, the Examiner considered that it would have been obvious to add an inorganic filler as taught by Yokouchi et al in order to reinforce the gel structure and film-forming properties of the grease composition.

Applicants respond as follows.

Applicants incorporate by reference the remarks given in the Amendment under 37 C.F.R. § 1.116 filed on July 28, 2004, and provide the following additional remarks.

Heimann is not properly combinable with Naka et al for the same reasons that Heimann et al is not combinable with Yokouchi et al. Namely, Naka et al. is directly related to a grease

composition for a rolling bearing. There is no discussion of the use of the rolling bearing in a marine environment or environment where improved corrosion resistance is needed. Thus, there is no motivation to one of ordinary skill to add a pH adjustor of Heimann to the rolling bearing of Naka because Naka is not concerned with protection from corrosive environments.

Furthermore, as noted above, column 8 of Heimann describes an extensive list of additives, but does not describe or discuss particles comprising an inorganic compound having an average particle size of 2 μm or smaller. This is because one of ordinary skill would expect such particles to impair the corrosion resistance grease/gel of Heimann. Thus, there is no motivation to one of ordinary skill to combine Heimann with Naka and Yokouchi et al in the manner suggested by the Examiner, relative to present claims 1, 11 and 13.

Amended claim 9 is patentable over the cited references for the same reasons as discussed above. Namely, none of the cited references, including Naka, discloses or suggests a reaction film forming agent selected from dialkyldithiocarbamic acid compounds and dialkyldithiophosphoric acid compounds. To support an obviousness rejection, all limitations must be taught in a combination of references.

Applicants further rely on the response above with respect to the rejection of claims 1 and 11.

For the above reasons, it is respectfully submitted that the claims as amended are patentable over Naka et al in view of Heimann et al and Yokouchi et al, and withdrawal of the foregoing rejection under 35 U.S.C. § 102(a) is respectfully requested.

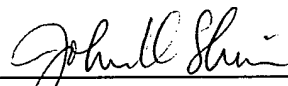
Withdrawal of all rejections and the allowance of claims 1, 4-9, 11-15 and 17 is earnestly solicited.

Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

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